

PATENT COOPERATION TREATY
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)
(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 12230341	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/AU2004/000380	International filing date (day/month/year) 26 March 2004	Priority date (day/month/year) 27 March 2003
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ A01K 15/02		
Applicant EQUITRONIC TECHNOLOGIES PTY LTD et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ (sent to the applicant and to the International Bureau) a total of 7 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand 10 June 2004	Date of completion of the report 12 January 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer B. NGUYEN Telephone No. (02) 6283 2306

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/AU2004/000380

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on translations from the original language into the following language which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3 and 23.1 (b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
 - ☐ the international application as originally filed/furnished
 - ☒ the description:
 - pages 1 - 23 as originally filed/furnished
 - pages* received by this Authority on with the letter of
 - pages* received by this Authority on with the letter of
 - ☒ the claims:
 - pages as originally filed/furnished
 - pages* as amended (together with any statement) under Article 19
 - pages* 24 - 30 received by this Authority on 15 December 2004 with the letter of 14 December 2004
 - pages* received by this Authority on with the letter of
 - ☒ the drawings:
 - pages 1/13 - 13/13 as originally filed/furnished
 - pages* received by this Authority on with the letter of
 - pages* received by this Authority on with the letter of
 - ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to the sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to the sequence listing (*specify*):

If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/AU2004/000380

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1 - 33	YES
	Claims	NO
Inventive step (IS)	Claims 1 - 33	YES
	Claims	NO
Industrial applicability (IA)	Claims 1 - 33	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

Claims 1 to 33 satisfy the criteria with respect to novelty and inventive step because none of the documents cited in the International Search Report discloses all the features as defined in amended claims 1 to 33. The claims are also not obvious in view of these documents either taken alone or in combination.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

- 1) Apparatus for monitoring the status of a horse, wherein the apparatus includes:
 - (a) a blanket having a first sensor formed from a detector and a processing module, the first sensor being adapted to generate indicating data indicative of at least one health status indicator;
 - (b) a second sensor for generating position data indicative of the position of the horse;
 - (c) wherein, in use, a processing system is adapted to determine from the position data, movement data indicative of the rate of movement of the horse, and determine the health status of the horse using the indicating data and the movement data; and,
 - (d) at least one battery connected to the first and second sensors and to a first part of an inductive coupling, provided in a recess in the processing module and wherein, in use, the battery is recharged by having the first part of the inductive coupling cooperate with a second part of the inductive coupling provided in a protrusion forming part of a hanging mechanism, the second part being coupled to an external power supply to thereby allow the at least one battery to be charged when the blanket is hung on the hanging mechanism.
- 2) Apparatus according to claim 1, wherein at least one of an antenna and a display is coupled to the rider in use, the apparatus further including a cable for connecting the module and the at least one antenna and display, the cable including a connector which is adapted to disengage if the rider falls.
- 3) Apparatus according to claim 1, wherein the processing module includes a processing system for at least partially analysing at least one of the indicating and the position data, wherein the processing module is coupled to a display, the display being adapted to provide information to a rider in accordance with at least one of the indicating and the position data, and wherein the display is adapted to be mounted on the horse's bridle in use.
- 4) Apparatus according to claim 3, wherein the display is wirelessly mounted on the horse's bridle.
- 5) Apparatus according to claim 1, wherein the health status includes at least one of the horse's:
 - (a) heart rate;

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- (b) blood pressure;
 - (c) temperature; breathing rate;
 - (d) blood flow rate; and,
 - (e) blood oxygenation levels.
- 5 6) Apparatus according to claim 1, wherein the second sensor is formed from a GPS sensor.
- 7) Apparatus according to claim 1, wherein the second sensor is adapted to be worn by a rider in use, and wherein the blanket further includes a connector for coupling the second sensor to the blanket in use.
- 10 8) Apparatus according to claim 1, wherein the second sensor is provided in the blanket.
- 9) Apparatus according to claim 1, wherein the blanket further includes a communications device coupled to the first and second sensors to thereby transfer at least one of the indicating and position data to a remote computer system the processing system being the remote computer system.
- 15 10) Apparatus according to claim 1, wherein the blanket further includes a store coupled to the first and second sensors to thereby store at least one of the indicating and position data to a remote computer system.
- 11) Apparatus according to claim 1, wherein the first sensor is a heart rate sensor and wherein the blanket includes at least one electrode coupled to the heart rate sensor and positioned so as to be in contact with the horse in use.
- 20 12) Apparatus according to claim 11, wherein the blanket includes at least one wire embedded in the blanket material, the wire being adapted to connect the heart rate sensor to the at least one electrode.
- 25 13) Apparatus according to claim 12, wherein the blanket is a woven blanket and wherein the wire is integrated within the weave of the blanket.
- 14) Apparatus according to claim 1, wherein the first sensor is removably mounted to a pouch, the pouch including one or more connectors adapted to cooperate with corresponding detectors provided on the sensor, to thereby couple the sensor to the blanket.
- 30 15) Apparatus for monitoring the status of a horse, wherein the apparatus includes a processing system adapted to:
- (a) receive, indicating data indicative of at least one health status indicator and

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- position data indicative of the position of the horse from apparatus according to claim 1;
- (b) determine from the position data, movement data indicative of the rate of movement of the horse; and
- 5 (c) determine the health status of the horse in accordance with the indicating data and the position data.
- 16) Apparatus according to claim 15, wherein the processing system includes a communications device for receiving the indicating and position data.
- 17) Apparatus according to claim 15, wherein the processing system determines the
10 health status of the horse using a predetermined algorithm, the predetermined algorithm defining a relationship between the at least one health status indicator and movement of the horse.
- 18) Apparatus according to claim 17, wherein the predetermined algorithm includes:
- (a) determining at least a low heart rate during low speed exercise;
- 15 (b) determining a number of heart rates during high speed exercise;
- (c) perform linear regression to calculate a linear regression line;
- (d) calculate, using the linear regression line, the velocities at at least one of:
- (i) heart rates of 200 beats per minute (V200); and,
- (ii) HRmax (VHRmax); and,
- 20 (e) determine a fitness indicator in accordance with the calculated at least one velocity.
- 19) Apparatus according to claim 18, wherein the line regression line is determined in accordance with:
- $$\text{HR} = a + bV,$$
- 25 where HR = heart rate;
- a = constant;
- b = constant; and,
- V = velocity.
- 20) Apparatus according to claim 18, wherein the method further includes deleting any
30 outlier values
- 21) Apparatus according to claim 20, wherein the method includes deleting all outlier values by at least one of:
- (a) deleting all results with a velocity of less than 40 kph;

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- (b) deleting all results during the period after exercise (from the time of occurrence of HRmax);
- (c) deleting all data equal to at least one of:
- (i) HRmax;
 - (ii) HRmax - 1;
 - (iii) HRmax - 2; and,
 - (iv) HRmax - 3;
- (d) deleting all data where there has been an increase in velocity, but that increase was not accompanied by an increase in HR;
- (e) deleting any data points which have a HR that is more than 10 beats per minute above the regression line at that speed, and recalculate the regression line if such outliers are deleted.
- 22) Apparatus according to claim 15, wherein the processing system is adapted to obtain indicating data and position data relating to a number of horses, the processing system being adapted to determine the health status of each of the number of horses.
- 23) Apparatus for monitoring the status of a horse, wherein the apparatus includes a processing system adapted to:
- (a) receive, from a first sensor formed from a detector and a processing module, indicating data indicative of the heart rate of the horse;
 - (b) receive, from a second sensor, position data indicative of the position of the horse;
 - (c) determine from the position data, movement data indicative of the rate of movement of the horse; and,
 - (d) determine the health status of the horse in accordance with a predetermined algorithm, the predetermined algorithm defining a relationship between the heart rate and the rate of movement of the horse, wherein the predetermined algorithm includes:
 - (i) determining at least a low heart rate during low speed exercise;
 - (ii) determining a number of heart rates during high speed exercise;
 - (iii) perform linear regression to calculate a linear regression line;
 - (iv) calculate, using the linear regression line, the velocities at at least one of;

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1. heart rates of 200 beats per minute (V200); and,
2. HRmax (VHRmax); and,
 - (v) determine a fitness indicator in accordance with the calculated at least one velocity.
- 5 24) Apparatus according to claim 23, the low heart rate being determined during trotting.
- 25) Apparatus according to claim 24, wherein the low heart rate is determined after the horse has been trotting for at least three minutes.
- 26) A system for monitoring the status of a horse, wherein the system includes:
 - 10 (a) a blanket having a first sensor formed from a detector and a processing module, the first sensor being adapted to generate indicating data indicative of at least one health status indicator; and,
 - (b) a second sensor for generating position data indicative of the position of the horse; and,
 - 15 (c) at least one battery connected to the first and second sensors and to a first part of an inductive coupling, provided in a recess in the processing module and wherein, in use, the battery is recharged by having the first part of the inductive coupling cooperate with a second part of the inductive coupling provided in a protrusion forming part of a hanging mechanism, the second part being coupled to an external power supply to thereby allow the at least one
20 battery to be charged when the blanket is hung on the hanging mechanism; and,
 - (d) a processing system, the processing system being adapted to:
 - i. determine from the position data, movement data indicative of the rate of
25 movement of the horse, and
 - ii. determine from the indicating data and the movement data, the health status of the horse.
- 27) A system according to claim 26, the system including apparatus according to any one of the claims 1 to 25.
- 30 28) A method of monitoring the health status of a horse, wherein the method includes:
 - (a) using apparatus according to claim 1 to generate indicating data indicative of at least one health status indicator; and,

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- (b) using a second sensor to generate position data indicative of the position of the horse; and,
- (c) determine from the position data, movement data indicative of the rate of movement of the horse, and
- 5 (d) determining the health status of the horse in response to the indicating data and the movement data.
- 29) A method according to claim 28, wherein the method is performed using the apparatus of any one of the claims 1 to 25.
- 30) A method of monitoring the health status of a horse, wherein the method includes,
- 10 in a horse blanket:
- (a) generating indicating data using a first sensor formed from a detector and a processing module, the indicating data being indicative of at least one health status indicator;
- (b) obtaining position data from a second sensor, the position data being indicative
- 15 of the position of the horse; and,
- (c) providing the indicating data and the position data to a processing system, the processing system being responsive to the indicating data and the position data to determine the health status of the horse, the processing system including a predetermined algorithm, the predetermined algorithm including:
- 20 (i) determining at least a low heart rate during low speed exercise;
- (ii) determining a number of heart rates during high speed exercise;
- (iii) perform linear regression to calculate a linear regression line;
- (iv) calculate, using the linear regression line, the velocities at least one of:
- 25 (1) heart rates of 200 beats per minute (V200); and,
- (2) Hrmax (VHRmax); and,
- (v) determine a fitness indicator in accordance with the calculated at least one velocity.
- 31) A method according to claim 30, wherein the method is performed using the apparatus of any one of the claims 1 to 25.
- 30 32) A method of monitoring the health status of a horse, wherein the method includes, in a processing system:

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- (a) receiving, from a first sensor formed from a detector and a processing module, provided in a horse blanket, indicating data indicative of at least one health status indicator;
 - (b) receiving, from a second sensor, position data indicative of the position of the horse; and,
 - (c) determine from the position data, movement data indicative of the rate of movement of the horse, and
 - (d) determining the health status of the horse in accordance with the indicating data and the position data.
 - (e) determine the health status of the horse in accordance with a predetermined algorithm, the predetermined algorithm defining a relationship between the heart rate and the rate of movement of the horse, wherein the predetermined algorithm includes:
 - (i) determining at least a low heart rate during low speed exercise;
 - (ii) determining a number of heart rates during high speed exercise;
 - (iii) perform linear regression to calculate a linear regression line;
 - (iv) calculate, using the linear regression line, the velocities at least one of:
 - (1) heart rates of 200 beats per minute (V200); and,
 - (2) H_rmax (VHR_{max}); and
 - (v) determine a fitness indicator in accordance with the calculated at least one velocity. .
- 33) A method according to claim 32, wherein the method is performed using the apparatus of any one of the claims 1 to 25.

DATED this 14th day of December, 2004

EQUITRONIC TECHNOLOGIES PTY LTD

By Their Patent Attorneys

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